Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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COMMENTS

The 2020-2021 Radiation Oncology Virtual Residency Match

In Regard to Odei et al.

To the Editor: We thank Odei et al for highlighting the challenges of the upcoming residency match given coronavirus disease 2019 (COVID-19) restrictions on away rotations and in-person residency interviews.[1] This is a timely issue for our specialty, given declining numbers of applicants in recent years.[2] We have launched several initiatives for medical students to mitigate COVID-19's detrimental impact to learning and recruitment to radiation oncology.

On April 27, 2020, Oregon Health & Sciences University and Stanford both launched virtual clerkships allowing us to engage students interested in learning about radiation oncology during the pandemic.[3,4] We were encouraged to see Odei et al report that almost half of the 65 responding residency programs planned or were exploring virtual clerkships at the time of the survey. For programs unable to set up virtual clerkships, virtual meet-and-greets can serve as an alternative way for students to connect with programs.[5] Students can meet with residents and faculty during Zoom sessions to learn more about a program. However, this experience cannot substitute for those components of a clerkship such as working alongside faculty and residents, obtaining feedback and recommendation letters, and establishing mentorship relationships.

Oregon Health & Sciences University and Stanford also set up the Radiation Oncology Virtual Education Rotation (ROVER), a series of virtual educational panels with case-based discussions across disease sites tailored to medical students. ROVER aimed to facilitate exposure to radiation oncology and faculty from different programs around the country while away rotations were on hold.[6] This series was advertised on social media, which allowed us to effectively reach many physicians-in-training about radiation oncology. The tweets on Twitter advertising our 6 ROVER sessions generated over a total of 292 "likes" and 138 retweets. The ROVER website[6] similarly has had over 5700 unique visitors since May 25, 2020.

We held a ROVER networking session[7] on September 10, 2020 about applying to radiation oncology in the current environment. This networking session allowed faculty and residents from programs around the country to discuss concerns about applying to radiation oncology with students in smaller breakout rooms. Of the students registered for the event, over a third reported not having a home radiation oncology program.

Although COVID-19 has introduced new challenges to our field, social media and virtual educational tools provide opportunities to augment radiation oncology education going forward. We welcome continued collaborative efforts on these innovative strategies to educate and recruit a talented and diverse workforce.

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Disclosures: none.

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Pulsed Reduced Rate Radiation Therapy with Bevacizumab in Recurrent Glioma

In Regard to Bovi et al.

To the Editor: I read with great interest the article titled "Pulsed reduced dose rate radiation therapy in conjunction with bevacizumab significantly extends survival over bevacizumab alone in recurrent high-grade glioma" by Bovi et al.[1] This retrospective report concludes that pulsed reduced dose-rate radiation therapy (PRDR-RT) plus bevacizumab provides significant progression free survival and overall survival advantages compared with bevacizumab alone. As a user of PRDR-RT, not only is this publication an important step forward in the evaluation of novel fractionation schemes in brain tumors, but also I agree with the authors in that PRDR-RT randomized trials should be conducted. PRDR-RT uses 2 important radiobiological phenomena. First, low-dose hyper-radiosensitivity as initially described by Joiner and Marples[2,3] and second, low-dose-rate radiation therapy of approximately 7cGy per minute. To achieve an effective dose-rate of approximately 7cGy per minute, the delivery of PRDR-RT using a conventional linear accelerator requires a beam-off period of approximately 3 minutes between pulses. This could be a deterrent in busy clinics with high demand of accelerator time. A potential way of minimizing this is by using helical tomotherapy for delivery of PRDR-RT.[4]

Contrary to central nervous system (CNS) tumor drug development, adoption of novel fractionation schemes in radiation oncology for these tumors has been slow. Clinical trials in CNS malignancies usually, for the most part, test a new drug in combination with standard fractionation or hypofractionation. That is, although drug development flourishes, evaluation of novel radiation fractionation schemes languishes.

Another fractionation scheme based on hyper-radiosensitivity is ultrafractionation, as published by Beauchesne et al.[5] In this phase 2 study (TEMOFRAC: concurrent 3-times daily ultra-fractionated radiation therapy and temozolomide) of low-dose radiation (0.75 Gy/fraction, 3 fractions/d to 67.5 Gy) and temozolomide in inoperable supratentorial glioblastoma, ultrafractionation was compared with historical controls from the biopsy-only subgroup of patients from the European Organisation for Research and Treatment of Cancer (EORTC) trial[6] of radiation therapy versus radiation therapy plus temozolomide. The results of the TEMOFRAC study compared favorably to the results of the EORTC trial (median survival and 2-year overall survival of 15.92 and 10.23 months, and 32.35 and 10.42%, respectively, $P = .0364$).

It is time that these types of fractionation schemes based on sound radiobiological principles are tested in large clinical trials. The results of Bovi et al[1] and others[7-10] should suffice to justify national or multi-institutional clinical trials to test these novel fractionations schemes in CNS tumors. The field of CNS radiation oncology needs to move forward in a progressive, responsible, and orderly fashion to offer our patients novel fractionation schemes akin to how new drugs are tested when combined with standard radiation therapy.

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